

## **Texas HAB Monitoring Efforts**

Texas Parks and Wildlife Department is tasked by the state with monitoring HABs in state waters, including red tide. During blooms, TPWD partners with agencies (including the Texas Dept of State Health Services, Texas Cooperative Extension and the National Parks Service), volunteers and universities to coordinate water sampling for HAB microscopic counts. In addition, TDSHS conducts shellfish mouse bioassays and TPWD conducts fish kill assessments. Texas A&M University collects water samples for a population genetics study of *Karenia brevis* to determine whether there are differences between Texas and Florida blooms.

Products include:

- 1) Daily e-mail bulletin to Texas HAB distribution list
- 2) Daily web update
- 3) Daily red tide hotline update
- 4) Report entered into TPWD's internal database at end of bloom(data available to public)
- 5) Count data provided to NOAA for Gulf HAB bulletin
- 6) Count data provided to TDSHS for regulation of commercial shellfish beds

To supplement the state monitoring data, the following are in place:

### **TPWD**

TPWD has partnered with NOAA to participate in the volunteer Phytoplankton Monitoring Network. Approximately 60 volunteers have been trained to recognize different species of plankton using a microscope; these volunteers sample over 30 static sites from Galveston to South Padre Island at least bi-weekly. Regular volunteer monitoring might provide an early warning of blooms, and volunteers can be called upon to monitor their sites more frequently if needed.

### **University of Texas Marine Science Institute**

Tracy Villareal's lab counts 10 samples monthly from 5 sites (2 per month) along the Texas coast. The samples are collected during TPWD's finfish monitoring collections, preserved and shipped to the lab at UTMSI. It is not a monitoring system in the sense of detecting blooms for management purposes. Rather, it is a research program used to validate satellite detection systems. In addition to the cell count information, we also measure chlorophyll a and nutrients. Hydrographic information is provided by TPWD.

### **Texas A&M University**

A grant from the Collaborative Institute for Coastal and Estuarine Environmental Technology (CICEET) is supporting work to develop an automated monitoring system for HAB species based on a newly-developed in situ imaging flow cytometer and automated image classification software. The Imaging FlowCytoBot, designed by R.J. Olson and H. Sosik (Woods Hole Oceanographic Institution), captures images of each cell in a known volume of water and subsequently the images are automatically classified into taxonomic groups. This system has been tested in Lisa Campbell's laboratory at TAMU in College Station and will be deployed on the pier at the Marine Sciences Institute of the University of Texas where it will be linked to a shore facility by a cable for power and data transmission. Deployment is scheduled for August

2007 and field operation is anticipated to run continuously until Fall 2008, with brief breaks for maintenance every two months. Data will be automatically downloaded (via Internet) each day to TAMU and to WHOI, where both sets of researchers will be able to examine it and to use the automated classifier. The final classified data (cell concentrations for all classifier categories) will be available in near-real-time to interested managers online through WHOI and TAMU websites. Although the initial target is *Karenia brevis*, additional HAB species can also be identified. The ultimate goal of this program will be a series of autonomous moored instruments with solar panels for power and cell phone communication with shore (for instrument operation and retrieval of cell classification results).

### **Interagency HAB Working Group**

The late 1990s saw the creation of the Texas HAB Working Group, which is an official subcommittee of the Toxic Substances Coordinating Committee created by an act of the 70<sup>th</sup> Texas Legislature. As more and more people are affected by HABs, participation in the workgroup increases; members include state and federal agencies as well as local entities such as parks and recreation departments and chambers of commerce. The group meets quarterly and focuses on HAB issues around the state, including bloom status, research and response. Early detection of blooms is a key goal of the workgroup, as are education and outreach efforts.

The following have come out of the HABWG:

- Red tide fact card: these cards include FAQs, health tips and seafood tips. Distributed to coastal communities (chambers of commerce, tourism centers, local businesses, hotels/condos, state agency offices, etc) to be displayed during the next bloom.
- Texas Brevetoxin Workshop: in April 2007 a number of researchers working on brevetoxin were invited to present their findings to the Texas HAB community.
- State HAB Coordinator: the HABWG saw the need for a state HAB coordinator and secured an EPA Gulf of Mexico Program grant. The Coordinator was hired in August 2004 and has since been given a permanent position at Texas Parks and Wildlife.
- NOAA's Texas HAB Bulletin
- TPWD's partnership with NOAA's Phytoplankton Monitoring Network.